

VPDES FACT SHEET ADDENDUM – MAJOR MODIFICATION

This document gives pertinent information concerning the staff initiated major modification of the VPDES permit VA0071471 for the Town of Tappahannock (WWTF). The permit is being processed as a Minor Municipal permit. The modification is solely intended for the insertion of nutrient concentration limits based on the installed technology approved in the CTO issued July 23, 2010 (Attachment 1). Certain Special Conditions related to compliance reporting and nutrients were added or updated as necessary. This fact sheet addendum will only address the aspects of the permit or permit developments that are changing in this modification. The following numbering schema is consistent with the current Fact Sheet.

4. DEQ Regional Office: Piedmont Regional Office
Permit Drafted By: Janine Howard Date: 10/01/10, 10/12/10, 10/20/2010
Reviewed By: Ray Jenkins Date: 10/12/10
Curtis Linderman Date: 10/20/2010

5. Present Receiving Waters Classification:
Receiving Stream: Hoskins Creek
Basin: Rappahannock River
Subbasin: N/A
Section: 1a
Class: II
Special Standards: none

Is the receiving stream tidal? YES

Is the receiving stream listed on the 303(d) report of impaired waters? YES

8. Permit Characterization:
☐ Private ☐ Federal ☐ State ☒ POTW ☐ PVOTW
☐ Possible Interstate Effect ☐ Interim Limits in Other Document

9. Facility Description: The construction of the following facilities is covered under the July 23, 2010 CTO:
- An in-line equalization basin with mixers and diffusers;
 - An anoxic basin including mixers that serves as the first stage of a 4-Stage Bardenpho process;
 - Conversion of the existing oxidation ditch basins (two existing trains) into stage two through four of the 4-Stage Bardenpho process. Each converted oxidation ditch contains recycle pumps, mixers, and fine bubble diffusers with associated blowers;
 - A recycle pump station to facilitate the return of nutrient laden recycle streams to the equalization basin for bio-accumulation;
 - A deep-bed tertiary filter to remove total suspended solids and particulate phosphorus;
 - A pump station to convey wastewater to the tertiary filters;
 - Chemical storage and feed equipment for alkalinity, polymer, and carbon source;
 - An aerobic digester with associated blowers and coarse bubble diffusers;
 - Minor additional changes.

These changes will allow for nutrient removal to 4.0 mg/l total nitrogen and 0.30 mg/l total phosphorus.

OUTFALL	DISCHARGE SOURCE	TREATMENT DESCRIPTION	DESIGN FLOW
001	Residential and commercial wastewater	Screening, grit removal, flow equalization and sedimentation Biological Nutrient Removal (via 4-stage Bardenpho process), tertiary filtration for TSS and particulate phosphorus removal, chemical feed for alkalinity adjustment, and polymer and carbon source addition, aerobic digestion of sludge, an ultraviolet disinfection system, and a cascade aerator.	0.8 MGD

17. Effluent Screening & Limitation Development:

Nutrient loadings to the Chesapeake Bay watershed are now limited under the Nutrient Trading general permit (9VAC 25-820). The Town of Tappahannock was issued coverage under this general permit (VAN020033) effective January 1, 2007. The individual permit became effective on June 7, 2007. According to 9 VAC 25-820-30.A, the general permit shall control in lieu of conflicting or duplicative mass loading effluent limitations, monitoring or reporting requirements for total nitrogen and total phosphorus contained in individual VPDES permits for facilities covered by this general permit. Based on the referenced regulation, nutrient loading limitations and associated monitoring were not included in the 2007 individual permit with the exception of a Total Phosphorus concentration (2.0 mg/L) and loading (6000 g/d) limit which was inserted in accordance with GM 07-2008- Nutrient policy for Nutrient Enriched Waters 9VAC 25-40-10 et seq.

Compliance with the Nutrient Loading Allocations assigned to the Town of Tappahannock in 9 VAC 25-820-70 is required by January 1, 2011. In order to achieve compliance with the load allocations the Town of Tappahannock WWTP has installed nutrient removal technology. According to 9 VAC 25-40-70.A, the Board shall include technology-based effluent concentration limits based on the technology installed. Per GM07-2008 Amendment 2, the limits should be inserted in the permit upon issuance of a CTC and become effective January 1st following issuance of a CTO for nutrient removal technology. The CTO for the nutrient removal technology was issued July 23, 2010, prompting this staff-initiated permit modification and insertion of technology-based effluent limitations for nutrients. The overall upgrade, as noted in the CTO, is designed to meet annual average total nitrogen of 4.0 mg/l and annual average total phosphorus of 0.3 mg/l (See Attachment 1). These limitations will become effective January 1 following the year in which the CTO is issued (January 1, 2011), at which time the Nutrient Enriched Waters (NEW) (9 VAC 25-40-10 et seq.) concentration limit of 2.0 mg/L (and loading limit) for Total Phosphorus will be superseded. Due to the timing of this modification, the NEW Total Phosphorus limit has been removed from Part I.A.1. Because the technology-based total phosphorus concentration limit of 0.3 mg/L is more stringent than the NEW limitation of 2.0 mg/L, antibacksliding is not a concern.

18. Antibacksliding Statement: All limitations in this modification are at least as stringent as the limitations in the 2007 permit.

19. Special Conditions:

C.3. CTC & CTO Requirements

Rationale: 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. Language regarding the issuance of a CTO and subsequent operation of nutrient removal facilities was added per recommendation by GM07-2008 Amendment 2 (October 23, 2007).

C.10. Compliance Reporting

Rationale:

Authorized by VPDES Permit Regulation, 9VAC25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Part e. was added as applicable in accordance with PRO convention as of Staff Decisions 6/29/2010. Part f. was added to clarify the applicability of this compliance reporting condition versus the Nutrient Reporting Calculations condition (Part I.C.16).

C.15. Nutrient Reporting Calculations

Rationale: §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9 VAC 25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, this special condition is intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

C.16. Suspension of Concentration Limits for E3/E4 facilities

Rationale: 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

C.17. Offset Requirement

Rationale: The Virginia General Assembly, in its 2005 session, enacted a new Article 4.02 (Chesapeake Bay Watershed Nutrient Credit Exchange Program) to the Code of Virginia to address nutrient loads to the Bay. Section 62.1-44.19:15 sets forth the requirements for new and expanded dischargers, including the requirement that non-point load reductions acquired for the purpose of offsetting nutrient discharges be enforced through the individual VPDES permit.

20. Change Tables:

The permit cover page was updated to include the Modification date and identify the Water Permit Manager as the signatory.

Table 1. Part I.A.1 and Part I.A.4: Monitoring & effluent limitation changes

Parameter	Effluent Limits		Monitoring Requirement		Reason
	From	To	From	To	
Total Nitrogen, Calendar Year Average (792)	----	4.0 mg/l	----	1/Year	9 VAC 25-40-70A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment; implemented per GM 07-2008 Amendment 2.
Total Phosphorus, Calendar Year Average (794)	----	0.30 mg/l	----	1/Year	9 VAC 25-40-70A authorizes DEQ to include technology-based annual concentration limits in

Parameter	Effluent Limits		Monitoring Requirement		Reason
	From	To	From	To	
					the permits of facilities that have installed nutrient control equipment; implemented per GM 07-2008 Amendment 2.
Total Nitrogen, Year-to-Date	----	NL	----	1/Month	9 VAC 25-820-10 et seq.; implemented per GM 07-2008 Amendment 2.
Total Phosphorus, Year-to-Date	----	NL	----	1/Month	9 VAC 25-820-10 et seq.; implemented per GM 07-2008 Amendment 2.
Total Phosphorus, Monthly Average*	2.0 mg/l 6000 g/d	----	2/Month	----	Removed in accordance with 9 VAC 25-820-10 et seq.; implemented per GM 07-2008 Amendment 2. This limit is superseded by the TP calendar year average concentration limit.

*Applies to Part I.A.1 only

Table 2. Part I.A.1.: Footnote changes applied to the existing facility (Part I. A.1.)

Footnotes		Change	Reason
Previous	Current		
d.	-	Deleted	2/Month description was no longer needed.
f.	d.	Language updated and re-lettered due to deletion of footnote d.	GM 07-2008 Amendment 2
e.	f.	Removed: See Part I.C.13 for nutrient reporting requirements. Added: See Part I.C.15 and Part I.C.16 for nutrient reporting requirements.	Part I.C.13 special condition deleted, therefore footnote updated to reflect new special condition numbering and re-lettered.
g.	e.	Inserted: Limit given is expressed in two significant figures	Footnote moved up owing to deletion of footnotes d. and e. and re-lettering.
-	g.	Inserted: The Total Nitrogen and Total Phosphorus annual concentration limits become effective January 1, 2011.	9 VAC 25-40-70A; implemented via GM 07-2008 Amendment 2-technology-based concentration limits become effective January 1 st of the year following the issuance of a CTO for the nutrient removal technology.
-	h.	Definition of TN added	Added to enhance permit clarity.

Effluent monitoring and limitation changes and additions in Part I.A.4, effluent limitation for the expanded 0.95 MGD facility, are identical to those in Part I.A.1, with the exception of the removal of the Total Phosphorus monthly average limit which was only found in Part I.A.1. and not Part I.A.4. Therefore refer to Table 1 to view the changes. Some of the footnote changes do differ, however, and they are highlighted below in Table 3.

Table 3. Part I.A.4.: Footnote changes applied to the expanded (0.95 MGD) facility

Footnotes		Change	Reason
Previous	current		
e.	-	Removed: "2/Month = two samples taken during the calendar month, no less than 7 days apart"	2/Month description was not needed therefore it was deleted.
f.	e.	Moved up in footnote list and Special condition numbers updated to reflect special condition changes in permit.	Former footnote e. deleted requiring renaming of footnotes below it.
g	f.	Moved up in footnote list and language updated.	GM 07-2008 Amendment 2
h.	g.	Move up in footnote list.	Former footnote e. deleted requiring renaming of footnotes below it.
-	h.	See Part I.C.17 for offset requirements.	GM 07-2008 Amendment 2

Table 4. Changes to Part I, Special Conditions.

From	To	Special Condition	Change	Reason
C.3	C.3	CTC & CTO Requirements	Language added about installed technology nutrient concentration limits.	GM 07-2008 Amendment 2.
C.10	C.10	Compliance Reporting	Formatting & Language updated, e. and f. added	VPDES Permit Manual, Section MN-3, January 27, 2010 version. Part e. was added in accordance with DEQ PRO convention and staff decisions as of 6/29/2010. Part f. was added to clarify the applicability of the condition to specific parameters (nutrients) and because of this change the entire special condition was updated to reflect the permit manual.
C.13	---	Watershed General Permit Controls	Removed	Special condition no longer needed. C.3and C.12 contain a reopener for technology-based limit insertion.
C.14	C.13	Industrial Pretreatment Program	Deletion of C.13 Watershed General Permit Controls prompted renumbering of Industrial Pretreatment Program special condition	Renumbering
C.15	C.14	303(d) Reopener	Deletion of C.13 Watershed General Permit Controls prompted renumbering of 303(d) list Reopener special condition	Renumbering
---	C.15	Nutrient Reporting Calculations	Added as C.15 following the reassignment of 303(d) list reopener special condition to C.14	Nutrient Reporting Calculations added per GM 07-2008 Amendment 2
---	C.16	Suspension of Concentration Limits for E3/E4 Facilities	Added	GM 07-2008 Amendment 2
---	C.17	Offset Requirement	Added	GM 07-2008 Amendment 2

21. Variances/Alternate Limits or Conditions:
None

23. Public Notice Information required by 9VAC25-31-280 B:
Comment period Start Date: 11/4/2010 End Date: 12/6/2010

Publication Dates: 11/4/2010 and 11/11/2010
Publishing Newspaper: *Rappahannock Record*

All pertinent information is on file and may be inspected, and copied by contacting Janine Howard at Virginia DEQ-Piedmont Regional Office, 4949-A Cox Road, Glen Allen VA 23060, (804) 527-5046, or Janine.Howard@deq.virginia.gov.

DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit.

24. Staff Comments:

- a. The 2010 permit fees for this facility have been paid.
- b. This discharge is not controversial and is currently meeting the required effluent limitations.
- c. e-DMR status: This facility is an e-DMR participant as of 11/4/2010.
- d. Staff initiated permit modifications do not involve the receipt of an application. Therefore the procedures described in GM 97-2001 regarding notification of affected local governments and downstream riparian owners (per §62.1-44.15:4.D of the Code of VA) do not apply in this situation and locality and riparian landowner notification was not carried out.

Other Agency Comments:

- a. EPA was provided the draft permit modification and Fact Sheet Addendum on 10/25/2010 for review and comment. EPA responded on 11/16/2010 and stated "As a result of this limited review we have no comments related to the permit modification." EPA chose to exercise its discretion in the review of this DEQ-initiated proposed permit modification and perform a review limited to the permit modification.
- b. VDH was sent the draft permit modification and fact sheet addendum on 10/21/2010. By letter dated 10/29/2010 VDH stated "There are no public water supply intakes within 15 miles downstream of the discharge / activity. We do not object to the permit."

Planning Statement: The discharge is in conformance with the existing planning documents for the area. (12/22/2010)

Public Comment: No comments were received during the Public Comment period from 11/4/2010-12/6/2010.

25. Total Maximum Daily Load

The receiving stream, Hoskins Creek, is subject to an Enterococci TMDL. Due to the required permit modification to address technology-based effluent limits, the TMDL will also be addressed. A final Enterococci monthly geometric mean limit of 35 N/100ml, effective since 6/01/2008, is currently active in the permit in accordance with the compliance schedule outlined in Part I.B. of the permit. This limit is sufficient to satisfy the TMDL, therefore no other limits were entered into Part I.A.1 or Part I.A.4.

26. Attachments:

Attachment 1- CTO for Nutrient Removal Technology (July 23, 2010)

**Attachment 1- CTO for Nutrient Removal Technology
(July 23, 2010)**

CERTIFICATE TO OPERATE

OWNER: Town of Tappahannock

FACILITY/SYSTEM NAME: Tappahannock Wastewater Treatment Plant

PERMIT NUMBER: VA0071471

**DESCRIPTION OF
FACILITY/SYSTEM:**

This CTO addresses the conversion of the existing oxidation ditches to a 4-stage Bardenpho process with tertiary filters. The project has been designed to improve nutrient removal to 4 mg/l TN and 0.3 mg/l TP (annual average limitations) at an annual average flow of 0.8 MGD. The discharge point is unchanged.

The projects covered under this CTO include the following:

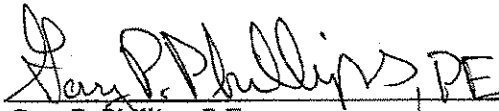
- in-line equalization basin with mixers and diffusers;
- new anoxic basin including mixers that serves as the first stage of a 4-Stage Bardenpho process;
- the existing oxidation ditch basins (two existing trains) are converted into the other three stages of the 4-Stage Bardenpho process (i.e., aerobic zone 1, anoxic zone 2, and aerobic zone 2). Each "converted" oxidation ditch contains nitrate recycle pumps, anoxic mixers, and fine bubble diffusers with associated blowers;
- a new recycle pump station to facilitate the return of nutrient laden recycle streams to the equalization basin for bio-augmentation;
- new deep-bed tertiary filtration is provided to achieve total suspended solids and particulate phosphorus removal;
- a new filter feed pump station feeds the tertiary filters;
- chemical storage and feed for alkalinity, polymer, and carbon source;
- new aerobic digester with associated blowers and coarse bubble diffusers;
- and other minor changes.

The sewage treatment works has a Reliability Class I designation and will continue to meet the requirements of this classification by the provision of emergency generators (one new), alarms, and SCADA to monitor and relay status and alarms to 24 hour manned locations.

**AUTHORIZATION TO
OPERATE:**

The owner is authorized to operate this facility in accordance with Section 190 of the Commonwealth of Virginia's *Sewage Collection and Treatment Regulations*.

ISSUED BY:


Gary P. Phillips, P.E.
Wastewater Engineering
Department of Environmental Quality

July 23, 2010
Date